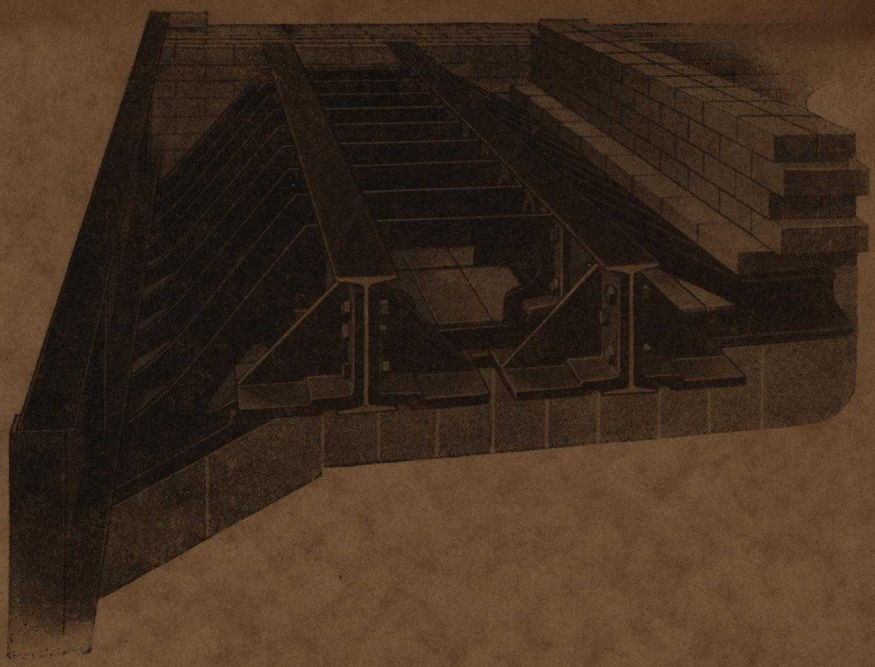
Flat Arches



LACLEDE-CHRISTY

ST. LOUIS, MO., U. S. A.

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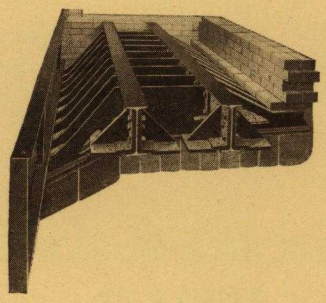
Laclede-Christy
FLAT ARCHES



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BY
LACLEDE-CHRISTY CLAY PRODUCTS COMPANY
ST. LOUIS, MO.

GUARANTEE

A guarantee can be worded so as to mean a great deal —or nothing at all. With us, the spirit, *not the letter of the guarantee, is the vital thing. Briefly,* **we guarantee satisfaction to every customer.**

A complaint has never come to our attention that we have not handled promptly and in a manner entirely satisfactory to our customer. We have been in business since 1844. This means that we have rendered satisfactory service in the past. We intend to remain in business for many years to come, which means that we must keep on giving satisfaction.

Only to satisfy *a customer does not fully meet our conception of service. We aim to give him such a full measure that it becomes a* pleasure *for him to do business with us.*

Laclede-Christy
ST. LOUIS

THE LACLEDE-CHRISTY ARCH IS MANUFACTURED UNDER U. S. LETTERS PATENT
AND ALL INFRINGEMENTS WILL BE PROSECUTED

The Laclede-Christy Flat Arch

MANY types of Flat Suspended Arches have been designed; much can be said in favor of all of them. The paramount issue in connection with any one design is: Has it stood the test of time?

Laclede-Christy Arches *must* have stood this test, otherwise there would not be so many of them in use today, neither would our arch business show the big increase that it does each year, nor could we afford to make such a broad guarantee as you have read on a preceding page.

Really, there are but *two* things that you need consider in selecting a furnace arch:

***First,* who is behind it?**

***Second,* what has it done elsewhere?**

Who Are Laclede-Christy?

The Laclede-Christy Company was founded in 1844, and has grown from a small factory until now it is one of the foremost manufacturers of fire-clay refractories, automatic stokers and furnace arches. That's a mighty big fact in itself. Very few firms in *any* industry, whose career started three-quarters of a century ago, are still in business. That Laclede-Christy is one of the select few can be the result of but one thing: the constant living up, all through these many years, to the very highest standards of *service.*

Laclede-Christy are the only flat arch manufacturers who also manufacture arch tile, and we know therefore that only the highest grade materials are used in our arches, and that the composition is the best for the purpose for which it is to be used. We maintain a staff of Service Engineers to insure that all are well satisfied; the word *service* means all that it meant back in 1844, and *more:* the *desire* as well as the ability to give every customer the kind of treatment that will meet *his* idea of what is right and good.

What Has the Laclede-Christy Flat Arch Done?

The best way to get the answer to this—a very satisfying answer, too—would be to ask the question of the hundreds of well-known firms using Laclede-Christy arches. In fact, if you desire to do this, Laclede-Christy will be glad to furnish you with their names and addresses.

With no bother on your part, you can hear what a few typical users say:

THE NATIONAL AMMONIA COMPANY
ST. LOUIS, MO.

February 26, 1920.

"As users of Laclede-Christy Flat Arches in the furnaces at our plant, it gives us pleasure to inform you that we have derived regularly satisfactory results from their use, and our experience inspires us to favorably recommend the products of the Laclede-Christy Company to anyone who may contemplate using them."

Very truly yours,

J. C. Atwood,
General Manager.

AMERICAN POTASH COMPANY
LINCOLN, NEB.

February 27, 1920.

"Answering your esteemed favor of the twenty-first, I am pleased to state that the Western Potash Works put a complete installation of the Laclede-Christy Flat Arches and Chain-Grate apparatus in at the time of building the plant.

"We have found both of these to be satisfactory in every respect, and can recommend them to those desiring this grade of economical construction for operating large plants."

Very respectfully yours,

W. E. Sharp,
President.

HOYT METAL COMPANY
ST. LOUIS, MO.

Granite City, Ill., March 3, 1920.

"We have been using Laclede-Christy Flat Arches for the last five years, and have had very good success with them.

"The greatest thing I find in their favor is that the arch can be renewed without the necessity of having a skilled brick layer, which is necessary when you have a turned arch."

Yours truly,

W. C. Urban,
Chief Engineer.

SCULLIN STEEL CO.
ST. LOUIS, MO.

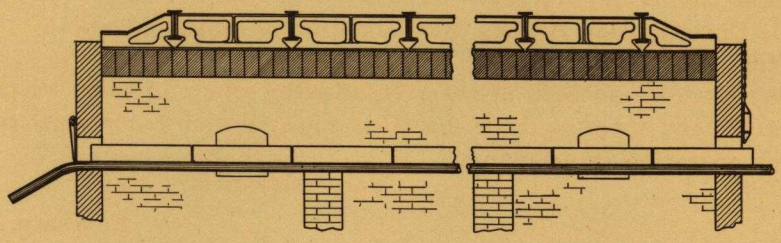
February 26, 1920.

"We have been using Laclede-Christy Arches for a number of years, with both chain grate and underfeed stokers, and find them entirely satisfactory.

"They have also given excellent service in several cases where it was necessary to build special annealing furnaces that could be readily taken apart to admit very large castings."

Yours truly,

L. C. Perry,
General Superintendent.



A Typical Installation of a Laclede-Christy Arch with a Large Annealing Oven, as Mentioned in Above Letter

MICHIGAN SUGAR COMPANY

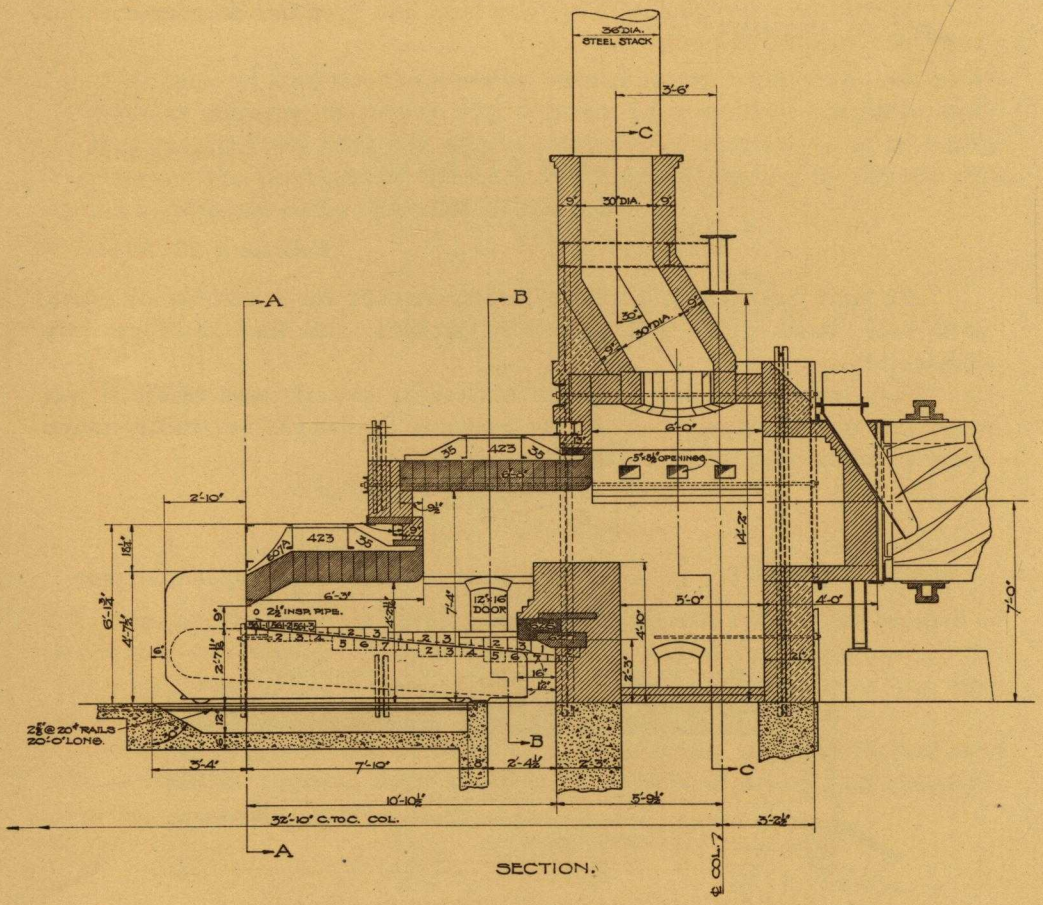
SAGINAW, MICH.

March 4, 1920.

"In accordance with your letter of February 23d, will say, we have the Laclede-Christy Flat Arches on our pulp driers at three of our plants. These arches are satisfactory, and we think they are the coming thing."

Yours very truly,

James Dooley,
General Superintendent.



Laclede-Christy Arches with One of the Pulp Driers Referred to in the Above Letter

SUPERIOR COAL COMPANY

GILLESPIE, ILL.

March 24, 1920.

"In reply to your letter of March 4th, regarding Stoker Arches, permit me to say that the Laclede-Christy Hipped Arch was put in service the last week in December.

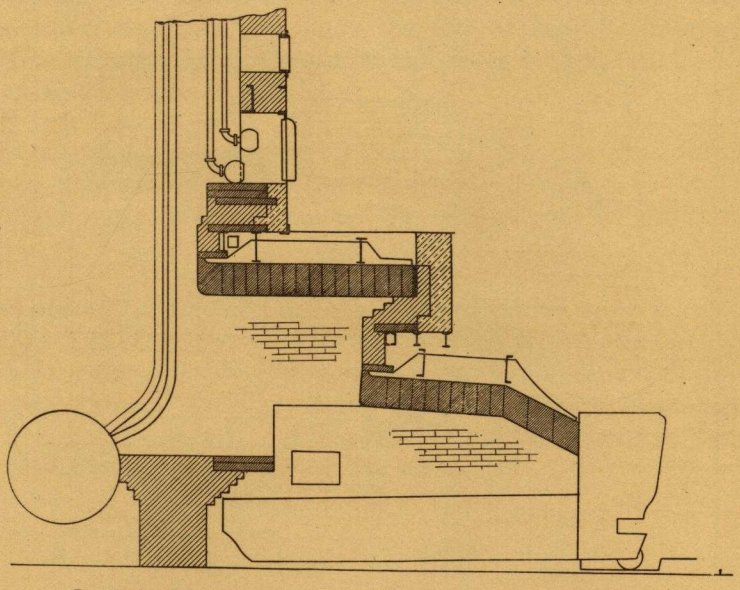
"We have had this boiler down three times since then, and is due to be taken down again this week. Each time this arch has been examined it looked fine, which certainly sounds good to me, considering the trouble we have been having with the ——— arch. We expect to place an order for another arch sometime soon.

"Would be very glad to have you stop and give us the once-over any time you happen to be up this way."

Yours very truly,

R. H. Kentfield,

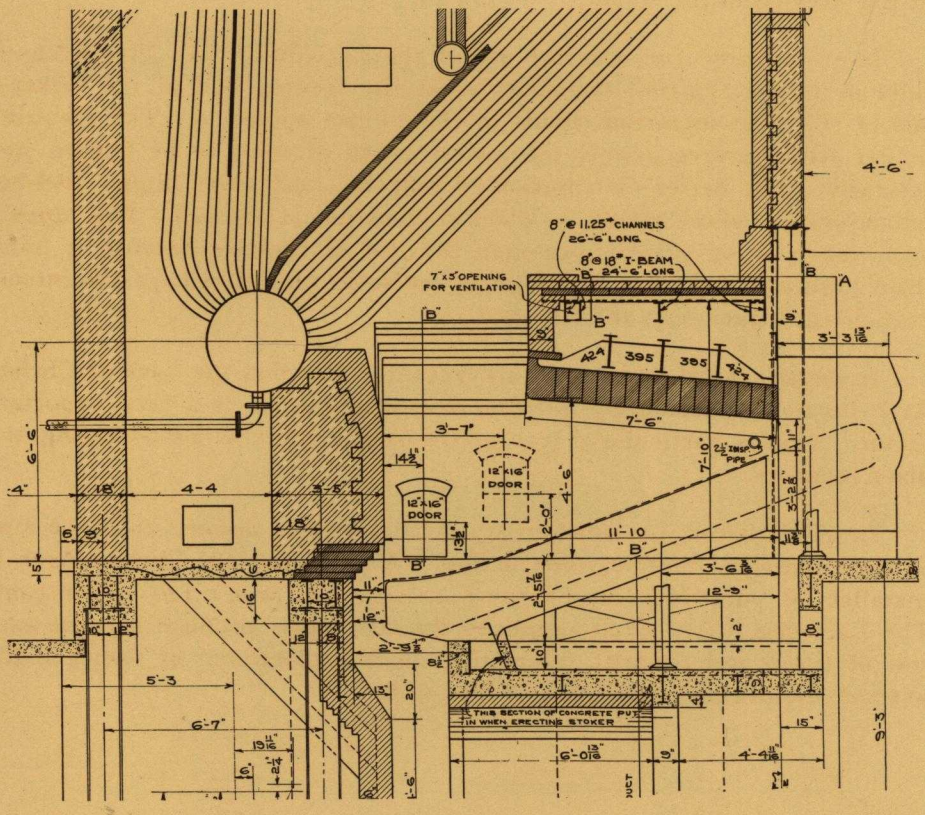
Master Mechanic.



Laclede-Christy Arches Referred to in Above Letter

Laclede-Christy Stand for Industrial Progress

Laclede-Christy are noted for their numerous contributions to scientific industrial development. The research work of our Ceramic Laboratory is responsible for many high-grade refractories, including our Suprafrax Tile, which will stand up where all others fail. To the Automatic Stoker field we have contributed the Stowe Stoker, a new type which marks a new era in fuel-burning economy. In Furnace Arches we are responsible for the perfecting of the Hipped Arch construction, the advantages of which are universally recognized.



A Laclede-Christy Arch with the Largest Progressive Feed Stoker in the World
A Stowe Stoker with a 1200-H. P. Badenhausen Boiler
Furnace Width, Twenty-one Feet

The Uses and Advantages of The Laclede-Christy Flat Arch

Literally, the Laclede-Christy Flat Arch can be successfully used in any place where a crown or top is required for a hot furnace.

In all *boiler furnaces* Laclede-Christy Arches help conserve fuel, because their construction results in *more efficient fuel burning* and a higher rate of combustion. This reduces your fuel bill and also greatly assists in the prevention of smoke.

In *stoker-fired furnaces* the use of the Laclede-Christy Flat Arch results in *strong ignition temperatures* at the feeding end of the stoker—one of the most important items in chain-grate operation. The resulting higher temperatures permit the lowest grade of coals to be burned successfully. The better distribution of reflected heat gives higher fuel-bed temperatures, which result in *lower combustion in the ash.* The hipped-arch construction greatly prolongs the life of the tile because it holds them high above the fire, although at the same time it reflects the intense heat directly back into the fuel bed.

In *metallurgical furnaces* of all types, the fact that the Laclede-Christy Arch insures an absolutely *uniform heat distribution,* is a very important factor. This is particularly true of the larger types of heat-treating and plate furnaces.

In *all furnaces,* Laclede-Christy Arches *reduce upkeep costs,* because of their massive, durable construction. When a Laclede-Christy Arch is installed in your furnace it's there to stay. *It won't fall in—it can't.* The Laclede-Christy Arch simplifies the tile repair problem because each row of tile is independent, permitting quick replacement of damaged tile without disturbing other units of the arch.

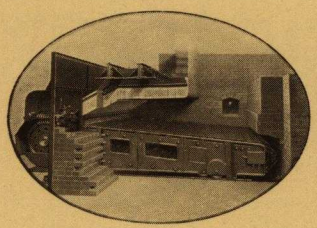
The Construction Features of The Laclede-Christy Flat Arch

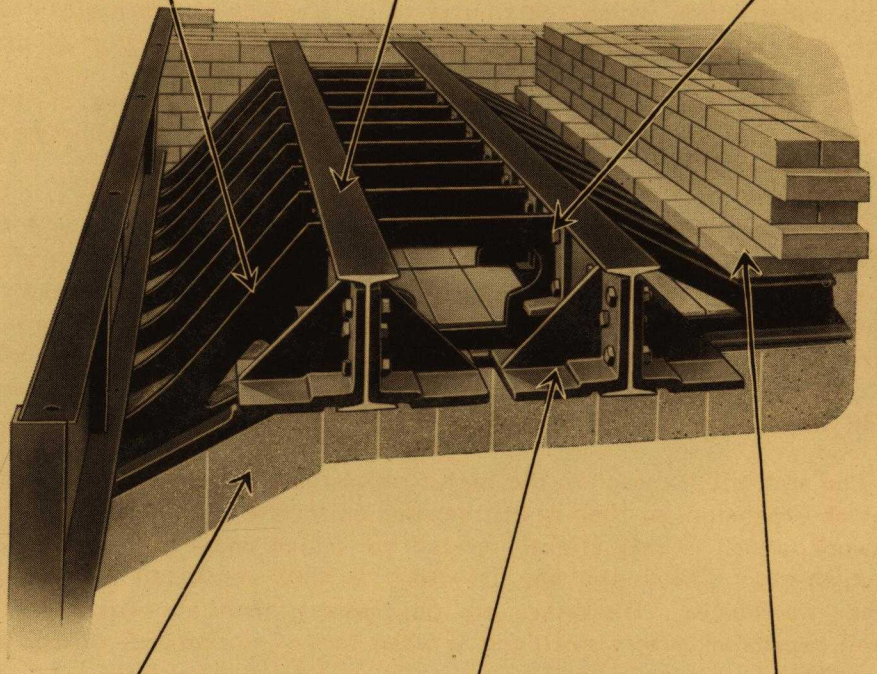
The design of the supporting structure of the Arch is based on the multi-piece or sectional idea. This is an exclusive and patented feature of this construction which contributes to its strength and flexibility and which permits the structure to be readily adapted to a wide range of uses.

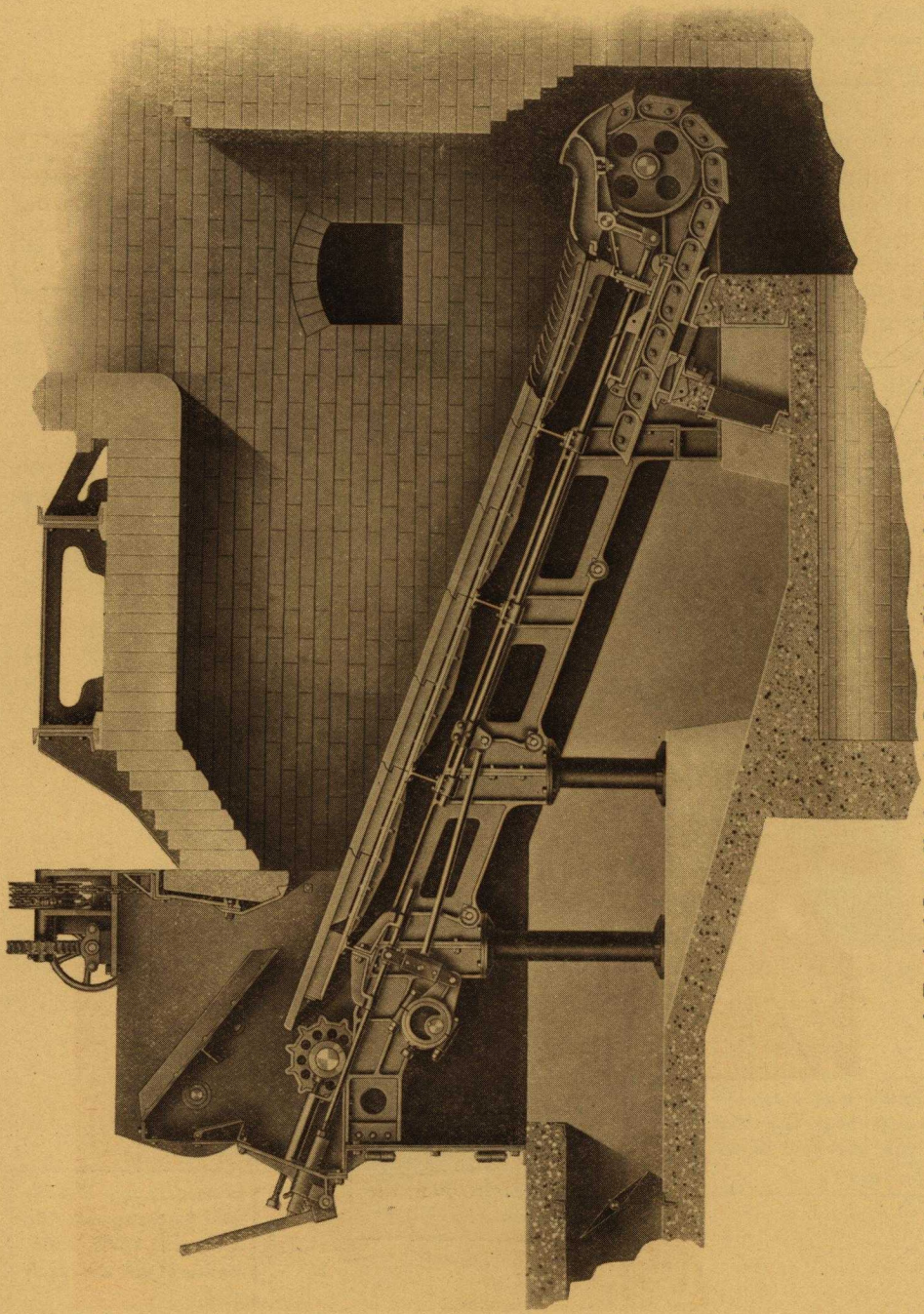
The Arch is supported by heavy steel cross-beams, having at their extremities cast-iron brackets which rest on and distribute the weight over the side walls.

Cast-iron brackets are securely bolted to these cross-beams, and the lower portion of these brackets is flanged to fit into the recesses of the arch-tile so that *every tile is suspended* in exact position yet with freedom for expansion and with *no bearing on any other tile.* The curtain wall is supported by the rear arch brackets and is absolutely independent of the arch tile, thus relieving the rear tile of all strain and permitting any of the arch tile to be removed without disturbing the curtain wall.

The arch tile, exposed to the high temperatures, has a very low co-efficient of expansion, so that it will expand uniformly with the supporting ironwork, which is only slightly heated but which has a high co-efficient of expansion. The supporting ironwork is well ventilated and cannot become overheated. Buckstays are unnecessary with our Arch, as the overall expansion is very small and is taken care of so that *side thrusts are impossible.*




Cast - iron Brackets that cannot warp or twist.
Heavy Beams support the arch. It can't fall in.
The Brackets are bolted to the Beams, thus strengthening and absolutely maintaining the unity of the structure.
Extra deep plain tile protecting the iron from the heat of the furnace
Cast - iron Brackets to rest on and spread the weight over the side walls.
Flat tile on Brackets that support the Curtain Wall independent of the arch tile.



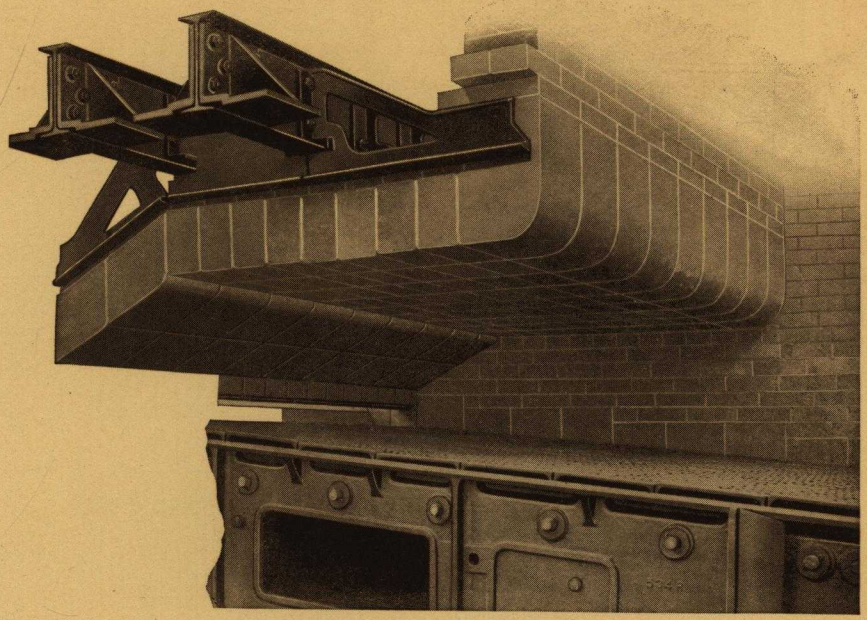
A Typical Installation of a Lacledе-Christy Arch with a Stowe Stoker

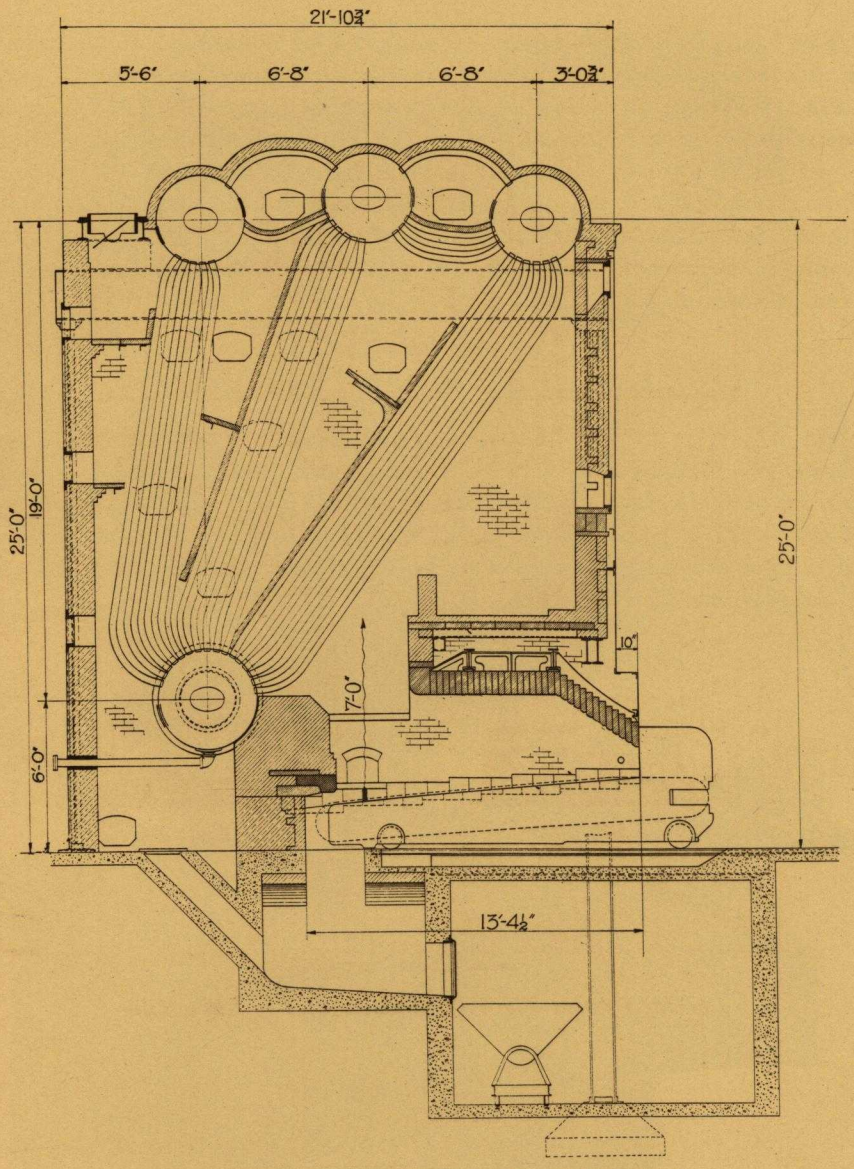
Arch Designs

The Laclede-Christy Arch is composed of a number of sections carried in stock and can be furnished in any size, *absolutely flat, sloping,* in the *hipped design, or in any shape* that may be required. Send us a sketch showing your furnace setting, with a description of your furnace troubles, and our Engineering Department will take pleasure in recommending that Arch best suited to your particular requirements, and with which we can guarantee absolute satisfaction. This service, of course, will be without obligation on your part. A variety of typical installations are shown on the following pages.

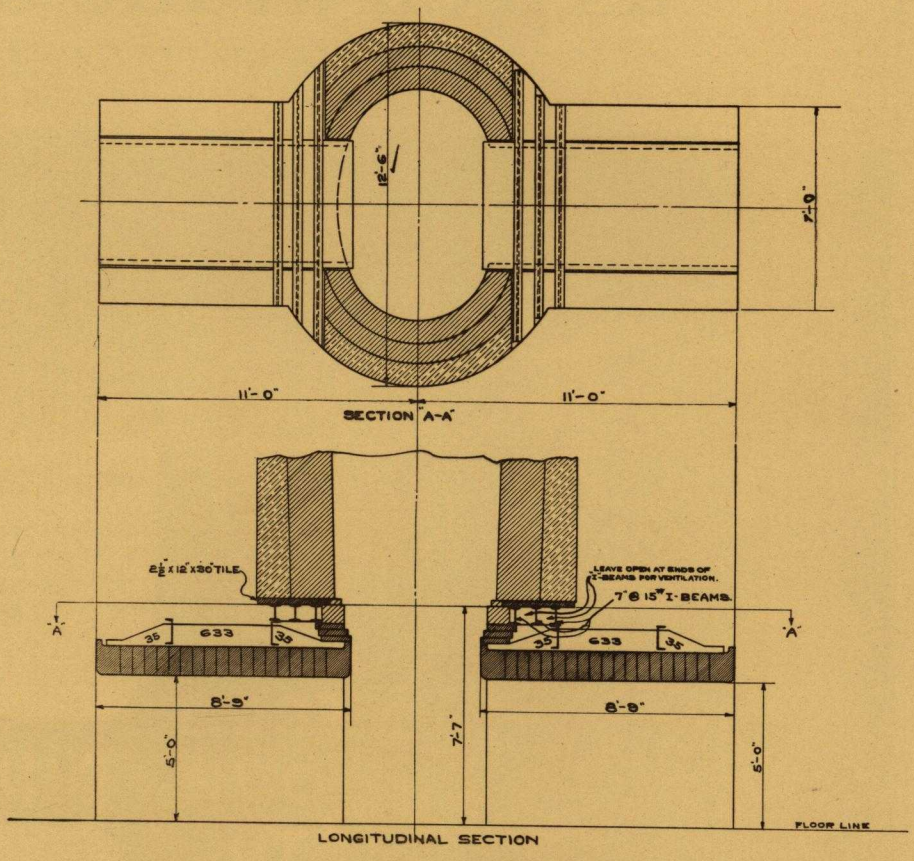
The Cost of a Laclede-Christy Arch

We urge you to buy Laclede-Christy Arches on the basis of year-in-and-year-out satisfaction. Buy our Arch on the basis of serviceability—put it in your furnace and then forget about your arch troubles. Don't experiment with arches whose chief virtue is low initial cost. The only basis of real economy is the lowest cost per year; that is what you get in the Laclede-Christy Flat Arch.



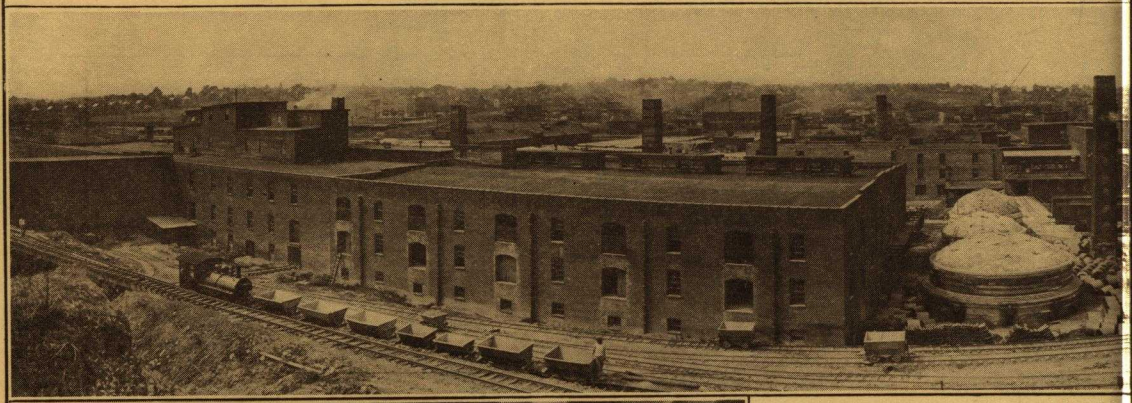


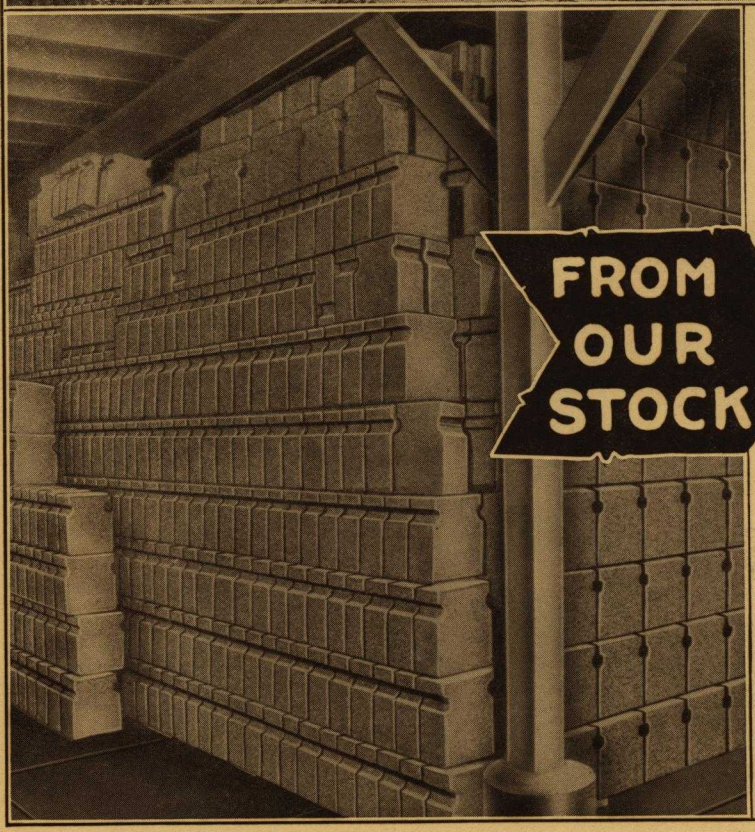
A Single Laclede-Christy Flat Arch with a Large Stirling Boiler and a Laclede-Christy Chain Grate



Laclede-Christy Flat Arches as Applied to Lime Kilns

Buy Your Arches
Who actually manufa
as well as the suppo





This is one of the Three

240 acres of Clay Mines
Three plants comprising
66 buildings---500,000 sq
Eight Miles private railroa

FROM OUR STOCK DIRECT T

Buy D
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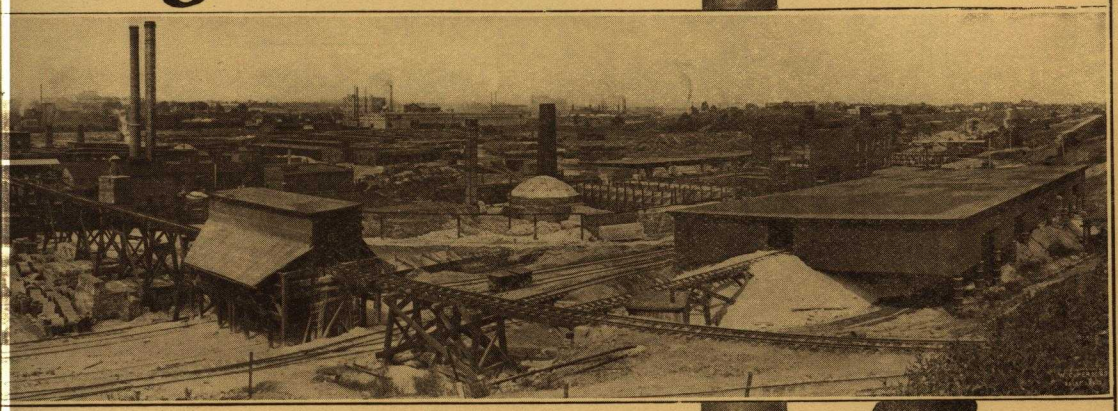
and Dist

rom The Company
ctures the Arch Tile
rting structure

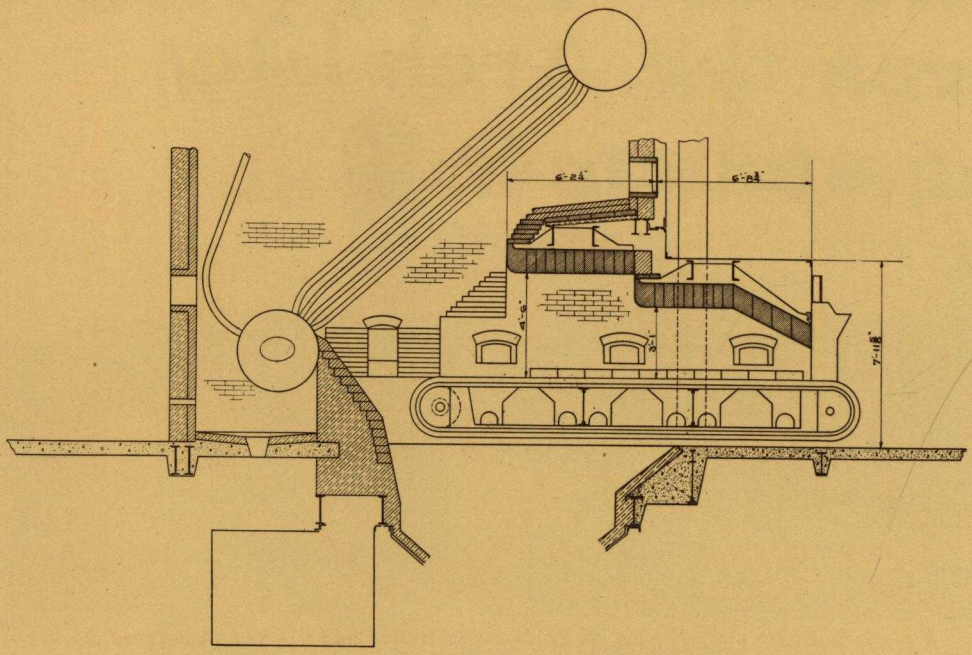


reat Plants behind Laclede Christy Flat Arches:

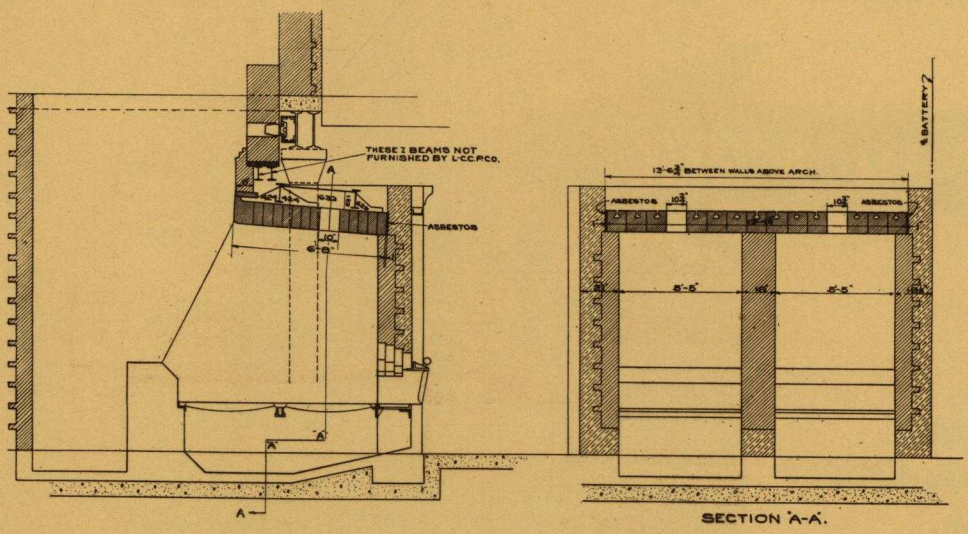
St. Louis.	Over one-thousand employees.
50 acres.	Daily capacity over 700 tons.
ft. floor space.	Over Seventy-five years experience.
tracks.	Four million dollars capital.

O YOUR PLANT

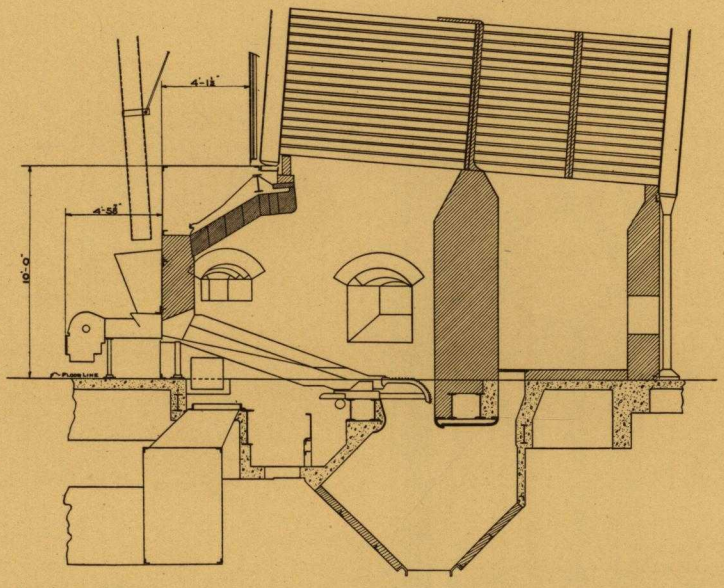
irect
nufacturer
d Representatives
ributors



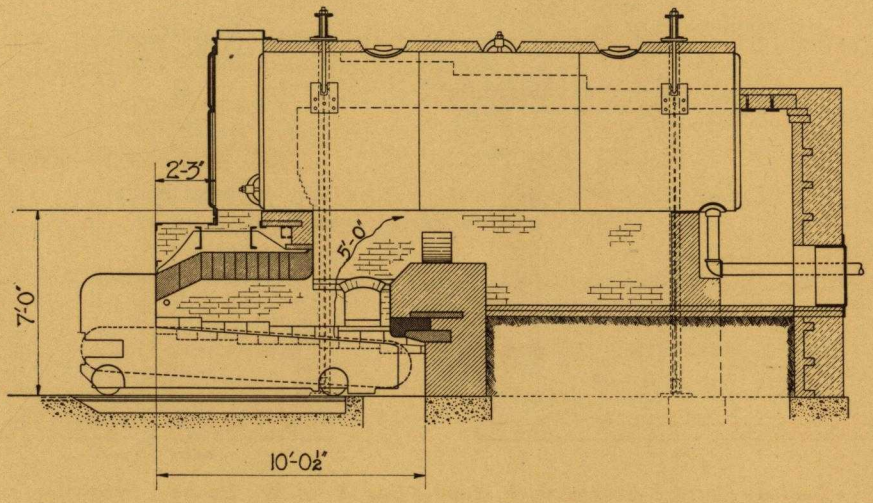
Laclede-Christy Arches with Stirling Boiler and a Coxe Stoker



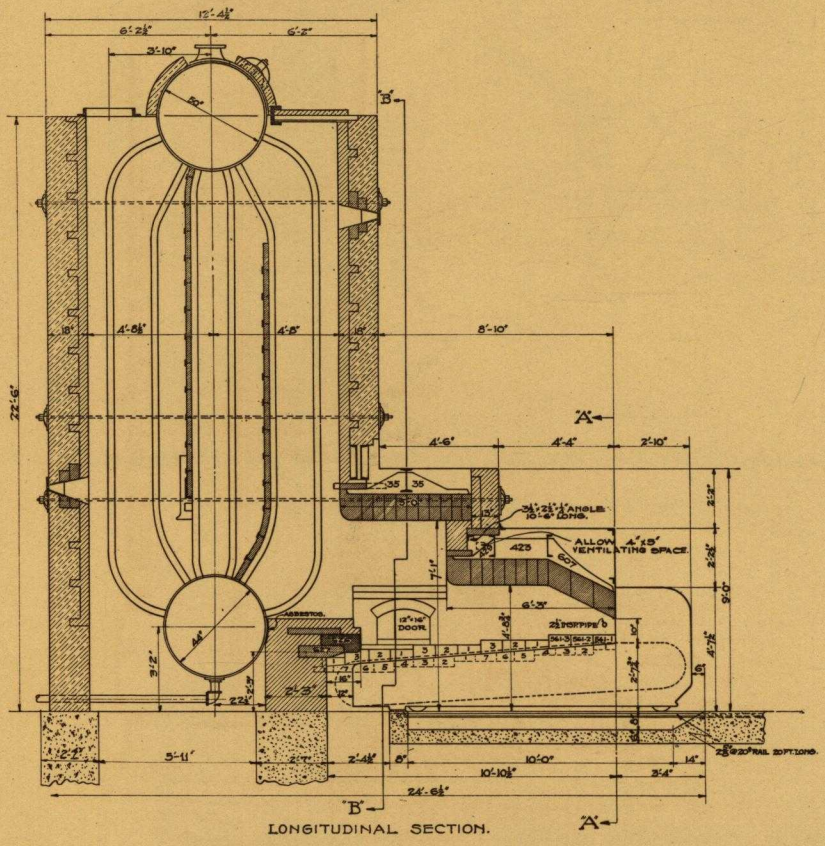
Laclede-Christy Arches with Hand-Fired B. & W. Boilers, Showing Holes for Feeding Shavings



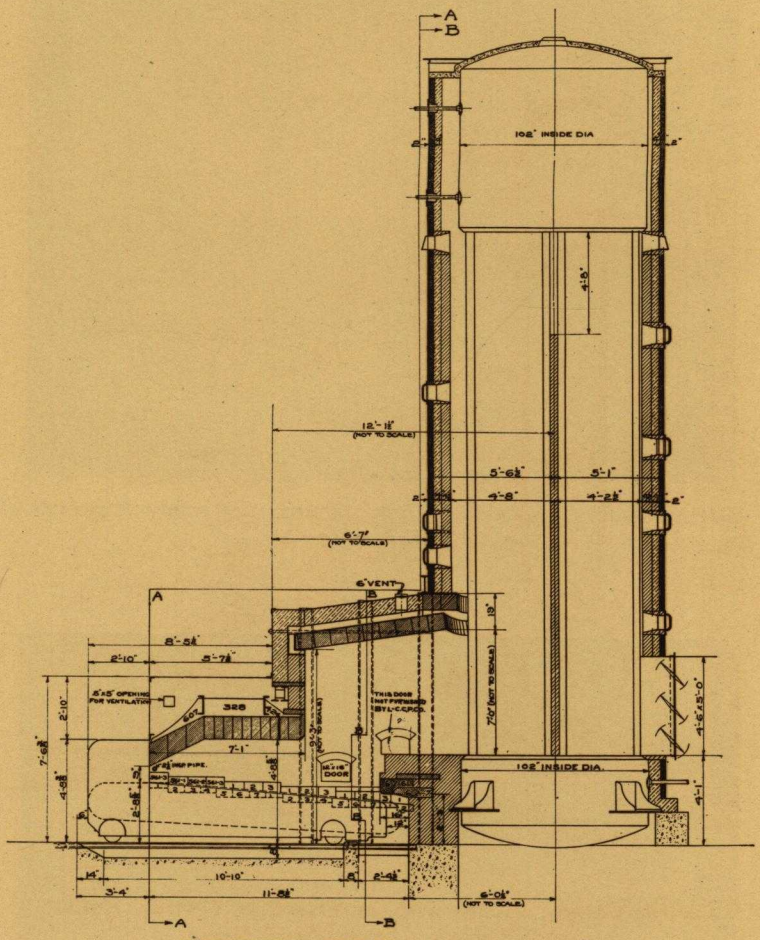
A Laclede-Christy Arch with an Edge Moor Boiler and a Riley Underfeed Stoker



Laclede-Christy Arch with an H. R. T. Boiler and a Laclede-Christy Chain Grate



Laclede-Christy Arches with an Erie City Vertical Boiler and a Laclede-Christy Chain Grate

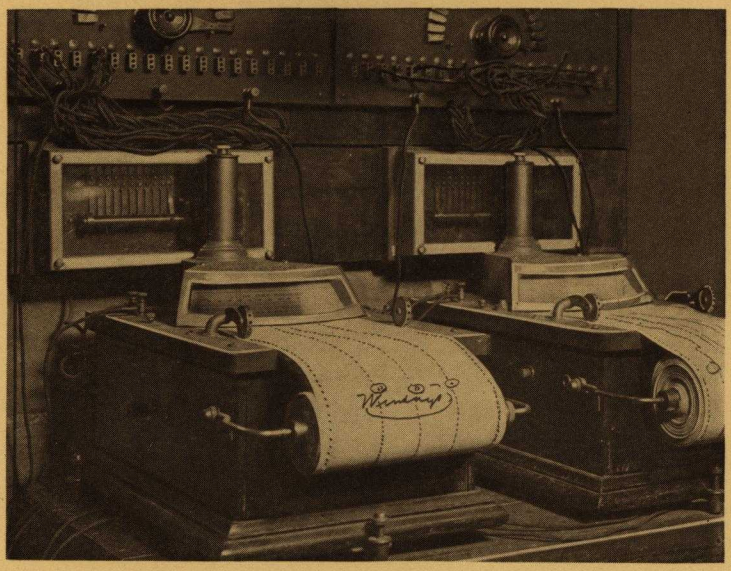


LONGITUDINAL SECTION.

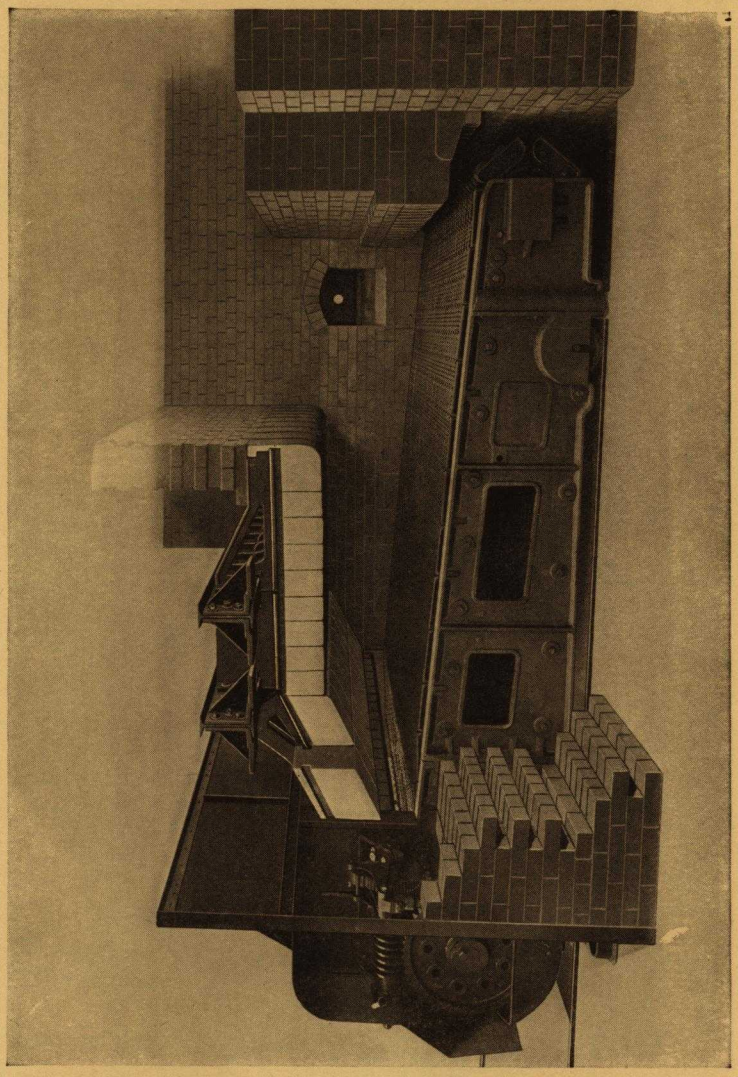
Laclede-Christy Arch with a Wickes Boiler and a Laclede-Christy Chain Grate

Where Science Works on Laclede-Christy Flat Arch Tile

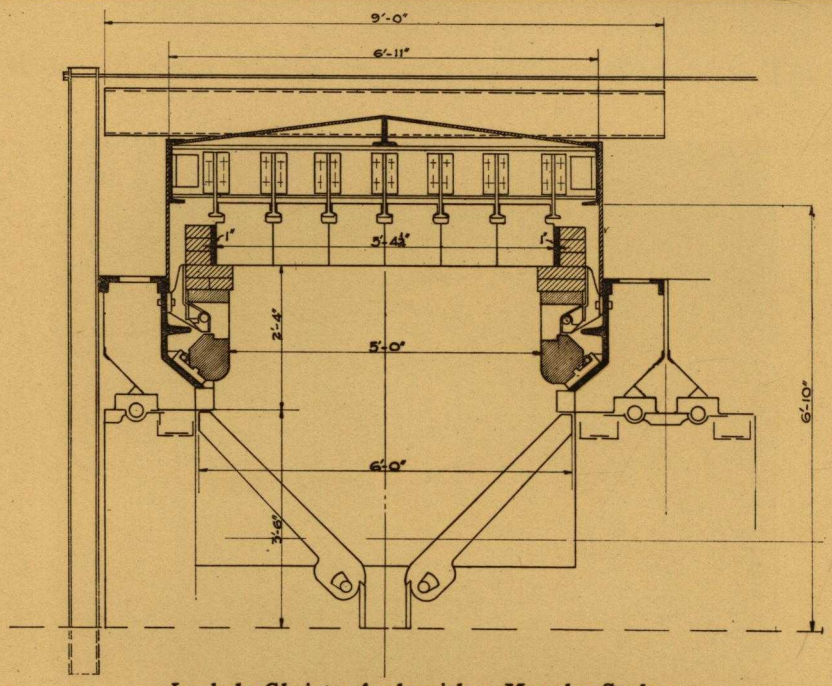
A View in One of Laclede-Christy's Laboratories where Materials are Carefully Chosen and Tested



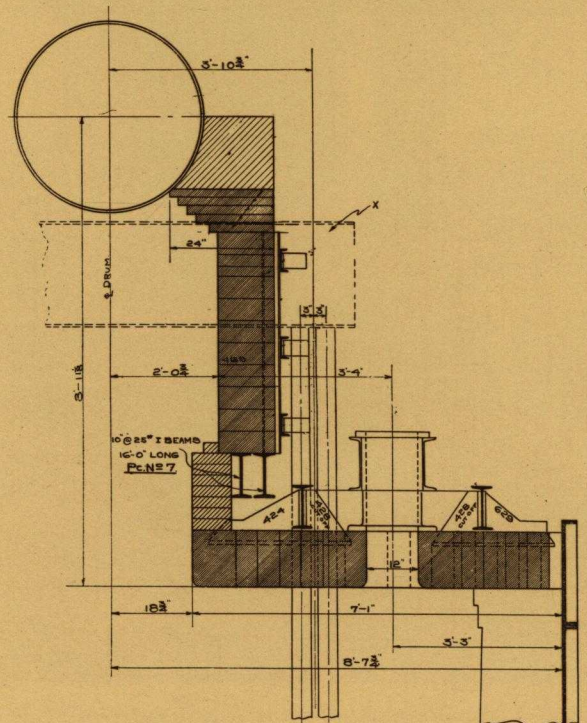
The Use of Pyrometers Guarantees Absolutely Uniform Burning of Laclede-Christy Flat-Arch Tile



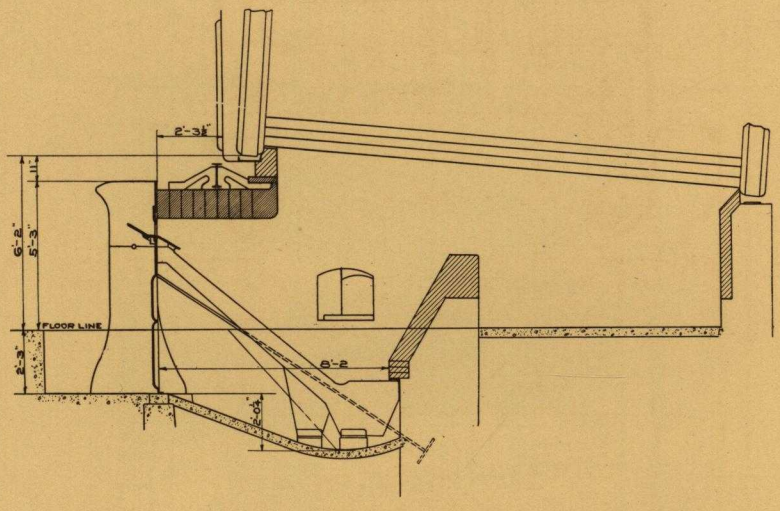
A Typical Installation of a Laclede-Christy Hipped Arch with a Chain Grate



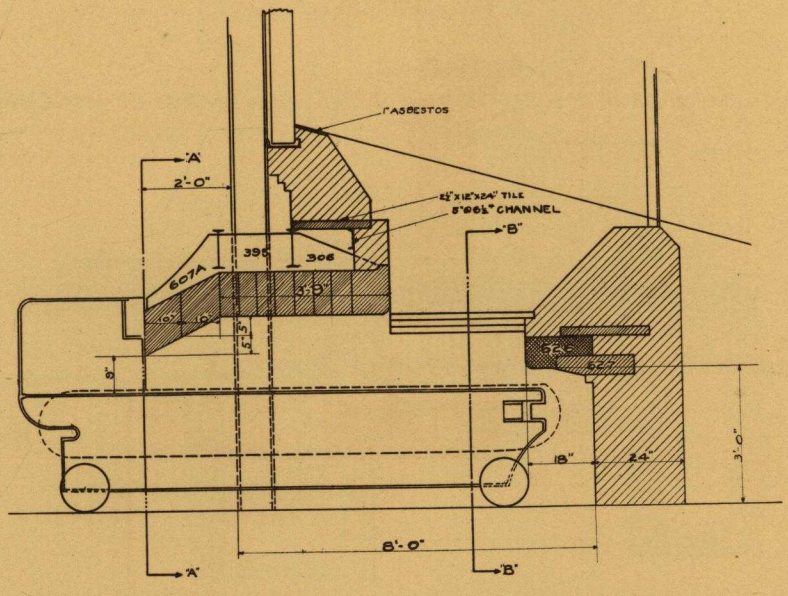
Laclede-Christy Arch with a Murphy Stoker



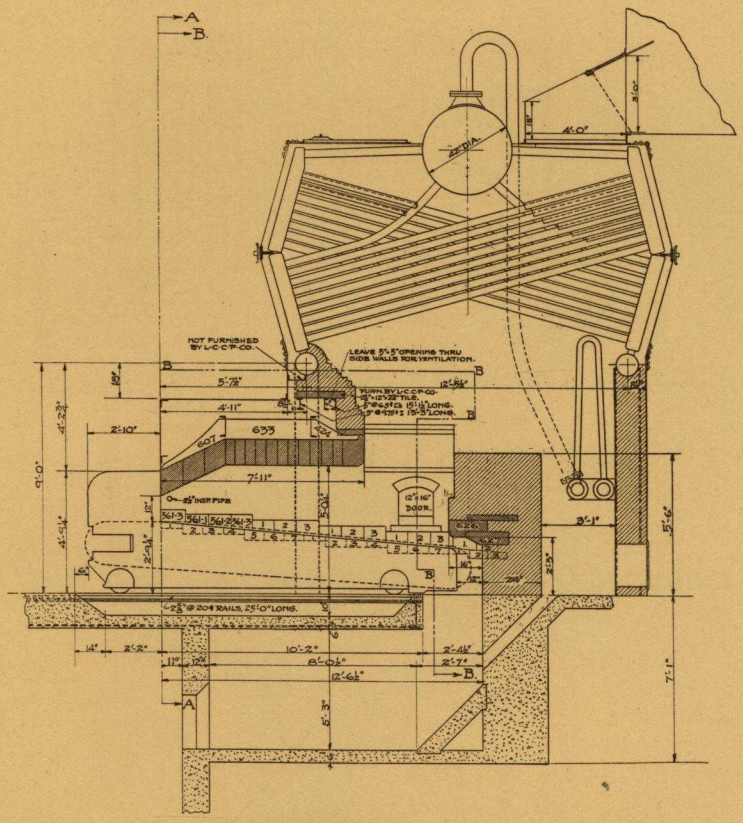
Laclede-Christy Arches Arranged for Pulverized Coal Burners



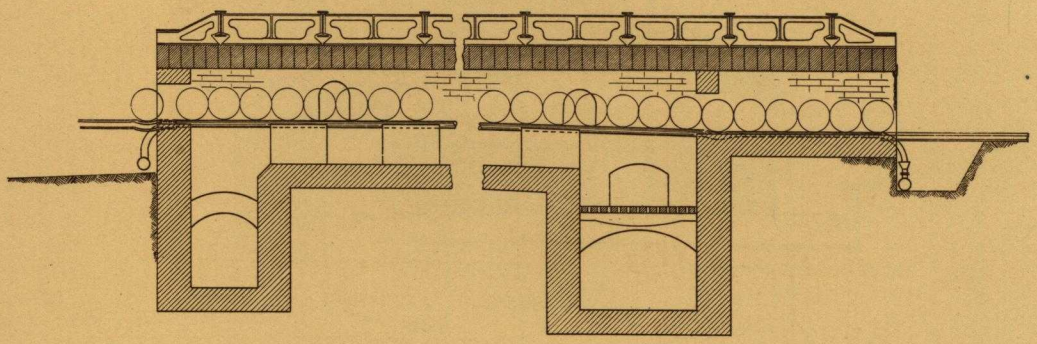
Laclede-Christy Arch with a Heine Boiler and a Roney Stoker



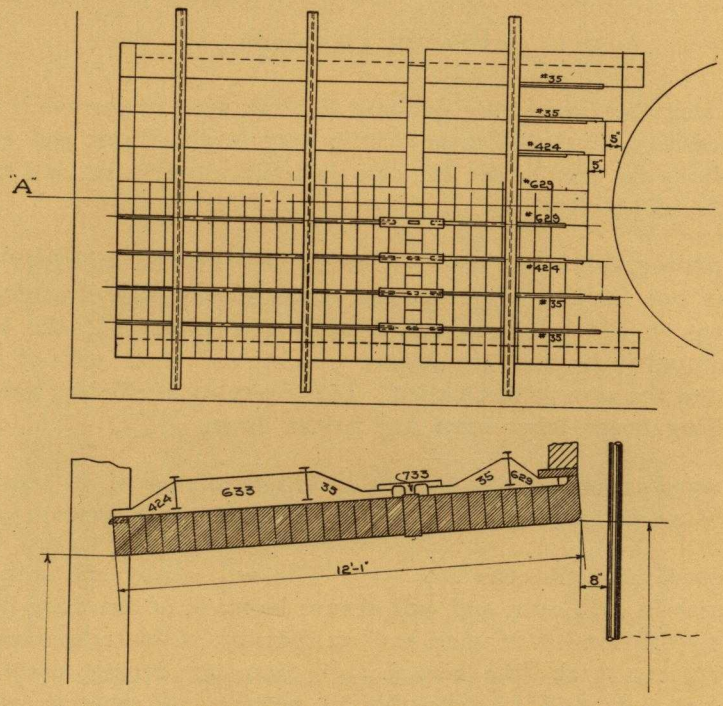
Laclede-Christy Arch with an Aultman & Taylor Boiler and a B. & W. Stoker



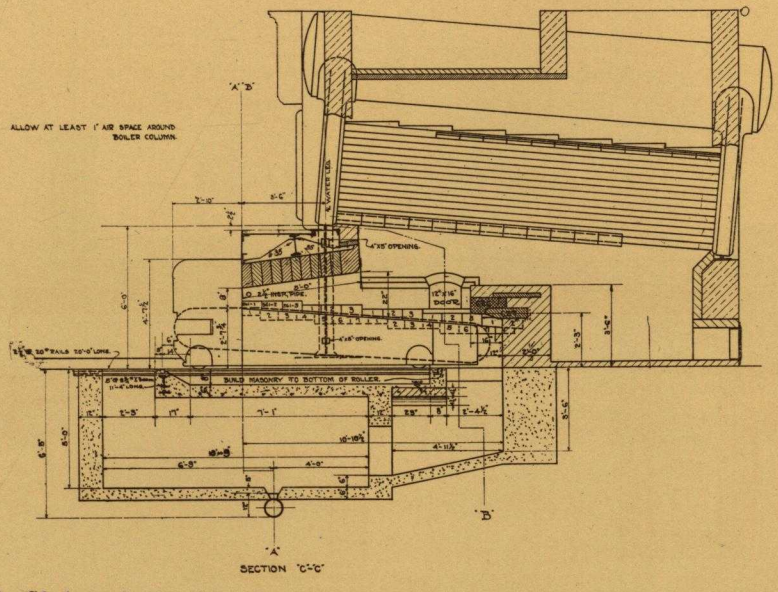
Laclede-Christy Arch with a Page-Burton Boiler and a Laclede-Christy Chain Grate



Laclede-Christy Arch as a Roof to a Large Pipe-Annealing Oven



A Single Laclede-Christy Arch with a Wickes Boiler



Laclede-Christy Arch with a Low Heine Boiler and a Laclede-Christy Chain Grate

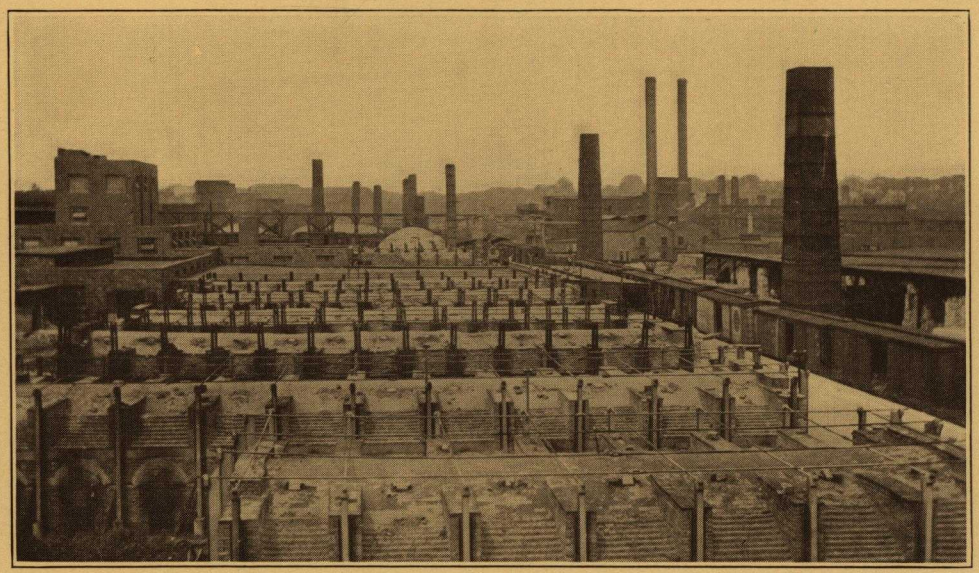
Prompt Deliveries

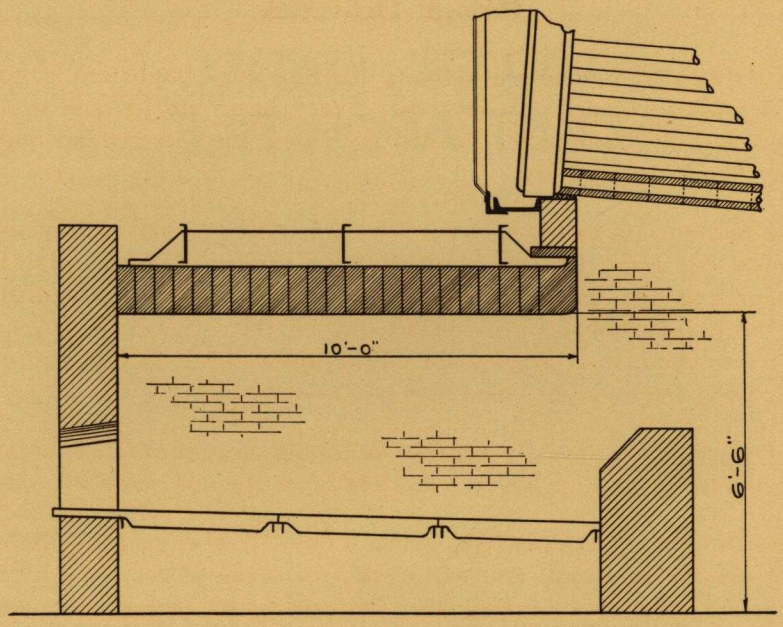
Realizing that immediate delivery is often very important if not absolutely necessary, Laclede-Christy carry very large stocks, and are, therefore, ready to fill your order for any arch tile, even in carload quantities, without the slightest delay.

The photograph below shows a few of Laclede-Christy's fifty-six kilns, and shows our facilities for handling your order. Tile manufactured in the factory on the left progress through the driers into the kilns, and when thoroughly burned are loaded out of the other end of the kilns directly into the cars or stock-shed. This up-to-date, efficient and economical handling keeps labor costs and prices down.

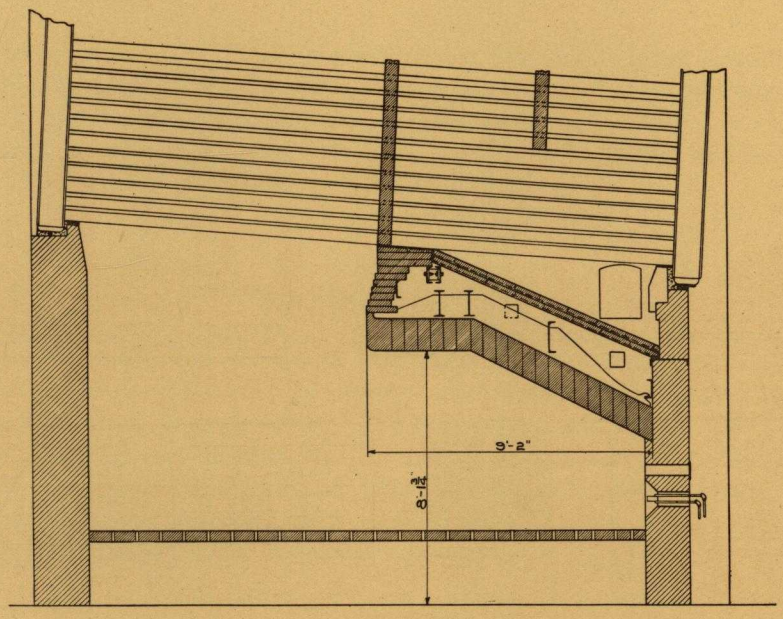
Our warehouses actually contain *hundreds of tons* of all standard arch tiles to insure prompt delivery. If time is an element, wire us your order.

Laclede-Christy Arches and Arch Tile will always be shipped from our factories in St. Louis, and will always be made of the same high-grade materials. Uniformity of size and uniformity of materials make every Laclede-Christy Arch "the very best." You can depend upon Laclede-Christy materials and Laclede-Christy service, and that is why every Laclede-Christy customer is satisfied.



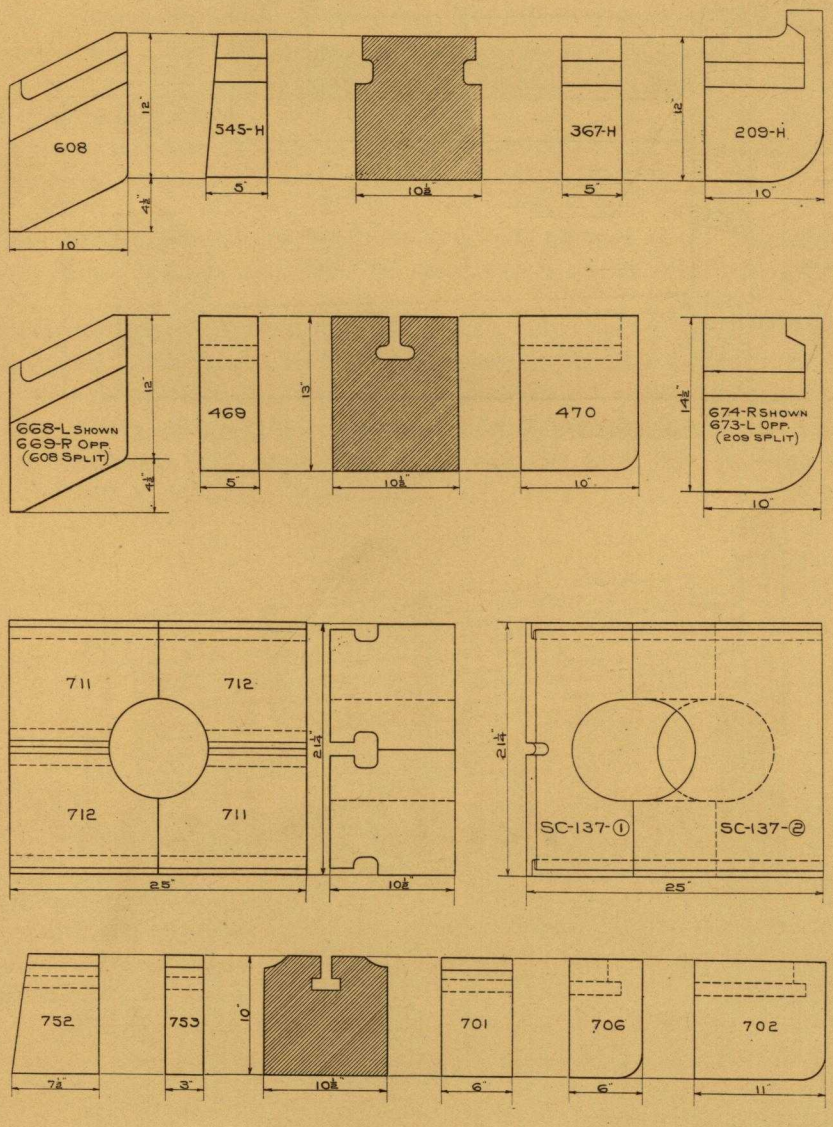


Laclede-Christy Arch as a Roof to a Dutch Oven



Laclede-Christy Arch with Oil-Fired B. & W. Boiler

LACLEDE-CHRISTY
FLAT ARCH TILE



Laclede-Christy Flat Arch Tile

Laclede-Christy arch tile are made of clay from the celebrated Missouri Cheltenham district, and from a mix that is in a process of continuous manufacture. This insures excellent uniformity of material. The tile are furnished in either the center-hung or side-hung design, and are made as plain as possible, without tongue or groove, as experience has taught that this is the best practice. The Laclede-Christy arch tile are *dependable.* They are the result of over 75 years of experience, and they are of that inherent quality which has characterized *all* Laclede-Christy products throughout this period.

Labor for Installation

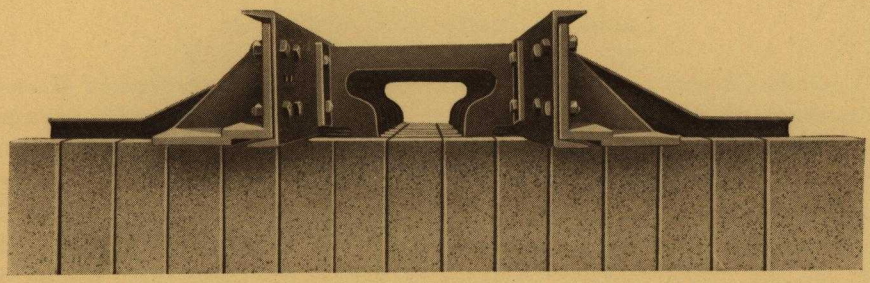
The supporting beams are set in position, as shown on the blueprint furnished, and the brackets are bolted tight to the beams through the holes provided. All material is inspected and carefully machined before shipment from the factory so that all parts will fit together easily and accurately. The tile are then buttered with fire clay or cement and threaded on to the brackets.

The construction of the Laclede-Christy Flat Arch is so simple that it is practically impossible to set the arch up wrong, and therefore all extra expense for experienced erectors or skilled masons is avoided. A manual of instructions, covering the erection as well as the care of the arch, is furnished to each Laclede-Christy Arch customer.

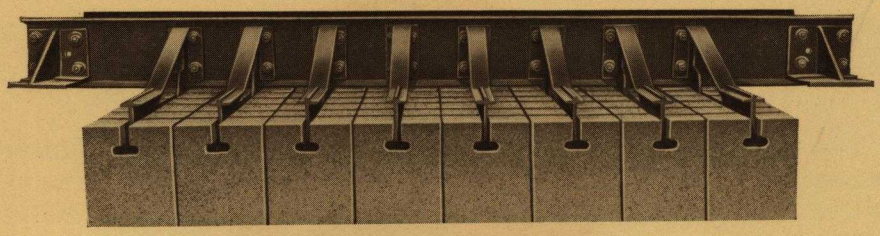
Service Record

The Laclede-Christy Company not only keeps a complete file with specifications, blueprints, etc., for every arch installed, but also a record of the performance of each arch. In other words, we do not forget our arch after it is sold and shipped, but we follow it up closely to be sure that it upholds the good reputation of Laclede-Christy arches. Every arch must be entirely satisfactory, and must give the service that could be rightfully expected of it.

Laclede-Christy Plain Flat "Center-Hung" Arch



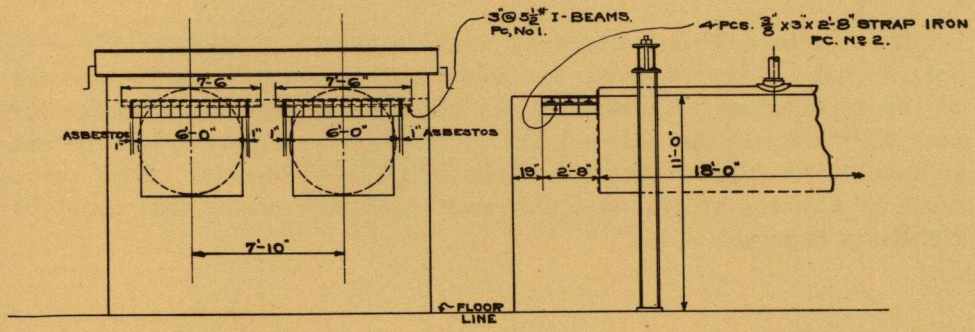
Side View



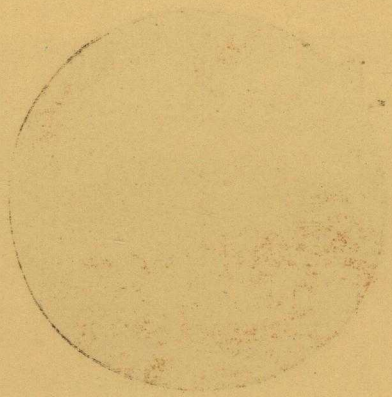
Front View

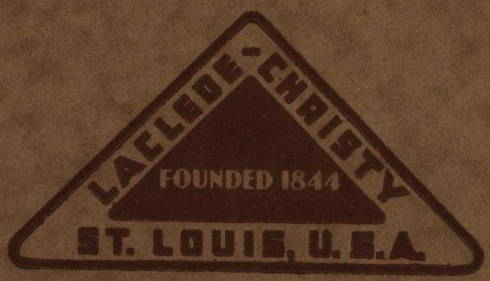
Laclede-Christy Rear Arch for H. R. T. Boilers

Where a heavy, durable back arch is desired, the bolted, bracketed construction shown above is used. However, for ordinary use, with small return tubular boilers, a lighter construction, consisting of center-hung arch tile strung on small I beams, as shown in the sketch below, is used with entire satisfaction.



L-C FLAT ARCHES
PATENTED





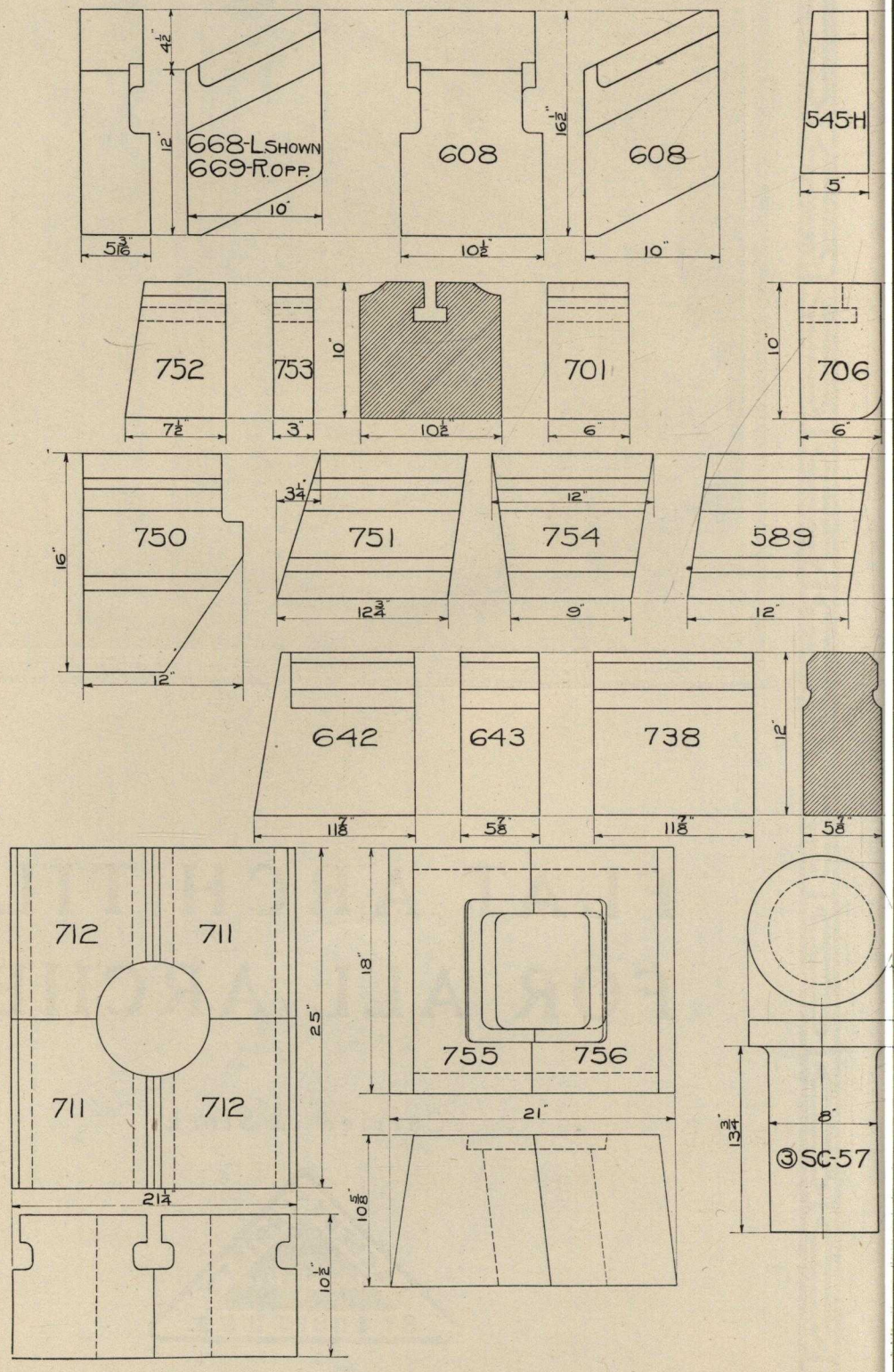
LAMBERT-DRAGON-NULL PRINTING CO
SAINT LOUIS

FLAT ARCH TILE FOR ALL ARCHES

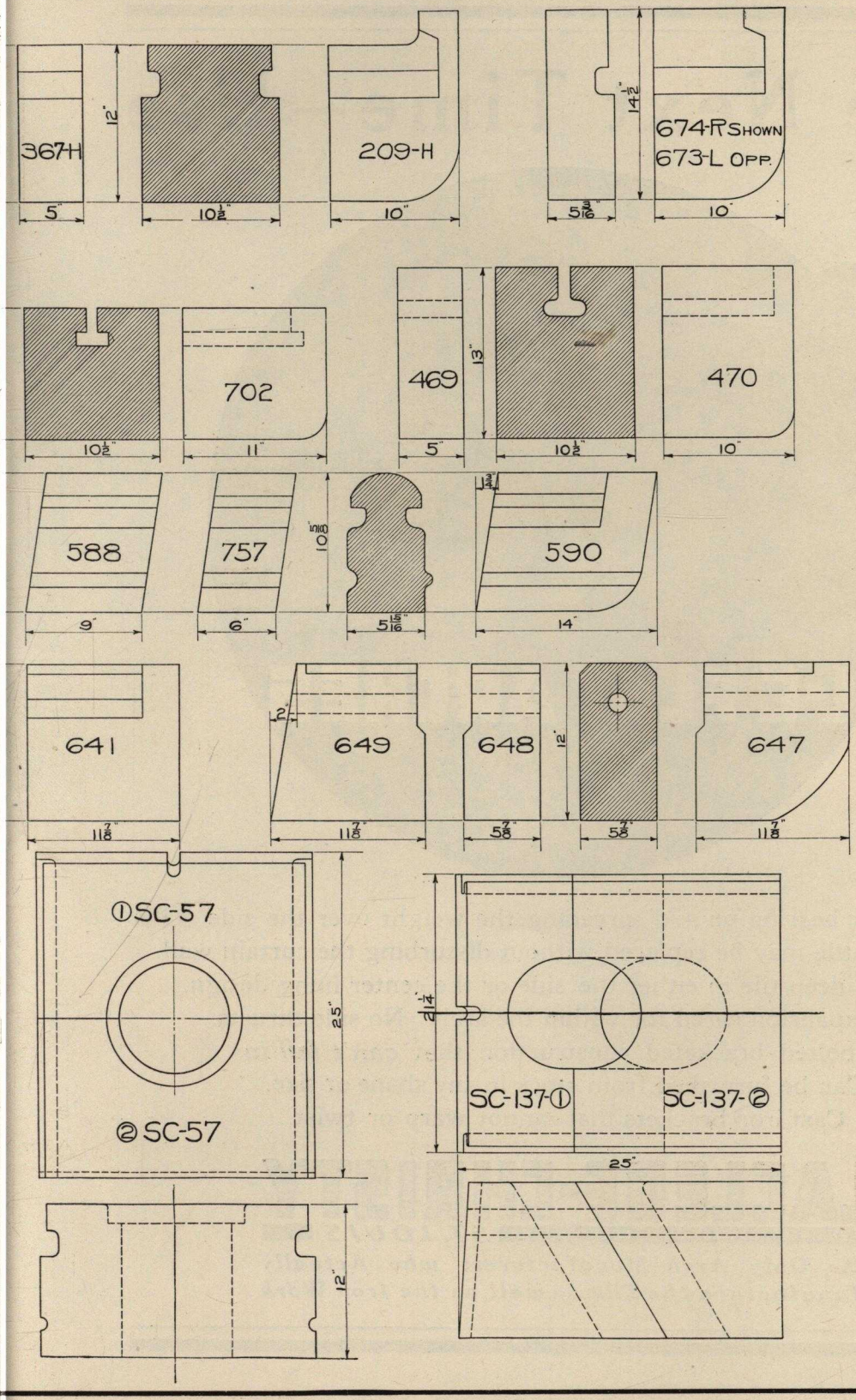
Carried in Stock

LACLEDE-CHRISTY
FOUNDED 1844
ST. LOUIS, U.S.A.

LACLEDE-CHRISTY



FLAT ARCH TILE



The Next Time—Use

Brackets for bearing on and spreading the weight over the side walls.
The arch tile may be replaced without disturbing the curtain wall.
A plain deep tile in either the side or the center hung design.
All expansion cared for within the arch. No side thrusts.
A bolted bracketed construction that *can't fall in.*
Can be furnished from stock in any shape or size.
Cast iron brackets that cannot warp or twist.

LACLEDE-CHRISTY

A BUSINESS INSTITUTION — FOUNDED 1844 ST. LOUIS

The Only Arch Manufacturers who Actually Manufacture the Tile as well as the Iron Work